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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/690,147	10/17/2000	Charles L Mohr	MOHR, CHARLES L.	2546

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EXAMINER

WEST, JEFFREY R

ART UNIT	PAPER NUMBER
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2857

DATE MAILED: 05/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/690,147

Applicant(s)

MOHR ET AL.

Examiner

Jeffrey R. West

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 16, and 17 is/are rejected.
- 7) ☒ Claim(s) 11-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawing in Figure 4 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "33" has been used to designate both "a motor" and "a powering train". Similarly, the drawing in Figure 5 is objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "47b" has been used to designate both "an upper leg" and "a lower leg". It is suggested that the "upper leg" be labeled "47b" as is described on page 21, line 11, of the specification.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "44a" (page 20, line 21).

3. The drawings in Figures 3 and 6 are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "4" and "71". A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because it is longer than the

permitted 150 words. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities:

On page 19, line 16, the "testing chamber" is incorrectly labeled "11" instead of "10" as it is labeled on page 19, line 3 and in Figures 1-3.

On page 21, lines 17-18, the "upper leg" and "lower leg" are incorrectly labeled "47a" and "47b" instead of "47b" and "47c" as they are labeled on page 21, line 11.

On page 22, lines 12-13, "spaced strain gauges" is incorrectly labeled "55" instead of "55a" as it is labeled on page 27, line 16, and in Figure 7.

Appropriate correction is required.

Claim Objections

6. In claim 2 "an axis aligned with the apex the conic indentation defined in the centering plate" should be ---an axis aligned with the apex of the conic indentation defined in the centering plate---.

7. In claim 4 "preventing passage of a fruit upwardly past the stipper plate" should be --- preventing passage of a fruit upwardly past the stripper plate ---.

8. Claims 11-15 are objected to because they are dependent on a rejected claim.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 17 is rejected under U.S.C. 112, second paragraph, as being vague and indefinite because it includes the limitation "maintaining the plunger in the fruit at at least one data point in the R-1 zone and one data point in the R-2 zone" while there is no mention of the R-1 or R-2 zones in the parent claims. It is suggested the claim 17 be dependent on claim 11, rather than claim 10, because claim 11 includes the limitation of classifying an apple into R-1 and R-2 zones.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over "HortPlus Quick Measure Penetrometer System" User Manual and Fact Sheet in view of U.S. Patent No. 6,142,010 to Merck, Jr. et al. and U.S. Patent No. 6,332,364 to Buschmann et al.

HortPlus discloses a computerized intrusive plunger fruit tester and corresponding method of operation wherein fruit is placed on a centering plate underneath a cylindrical penetrating plunger that is repeatedly driven into the fruit (User Manual, page 4) to a correct depth at a constant velocity by a motor (Figure). HortPlus also discloses a load cell (i.e. stress block) for sensing the pressure resisting plunger motion into the fruit toward the centering plate and transmitting these measurements to a computer that converts the pressure data into fruit firmness and maturity information for display, using corresponding software (Fact Sheet, page 2). Further, it is considered inherent that in order for the software to translate the obtained pressure data into fruit firmness data, the software must compare the pressure data measurements with some type of similar fruit data profile so that when the pressure exceeds certain values, corresponding maturity levels can be determined.

HortPlus does not teach, however, the specific construction of the motorized plunger, an optoelectric sensor for sensing the position of the plunger, or the physical design of the fruit tester comprising a base between two up standing sides connected by a top.

Merck, Jr. discloses a penetration hardness tester comprising a support platform, located on a base, on which an anvil is located with a material to be tested placed on the top surface of the anvil (column 2, lines 40-43), and an indenter plunger, connected to a load cell, located directly above the anvil that is vertically movable with respect to an upper platform (column 2, lines 43-46). Merck, Jr. teaches

controlling a motor on the apparatus (column 2, lines 64-65), to move the indenter toward the material being tested, using a powering train that drives a belt and rotates a ball screw which translates the rotational motion into the vertical motion of the indenter platform (column 3, lines 9-12).

Merck, Jr. also discloses a control system including a sensing head, or optoelectric device (column 3, lines 63-65), attached to the frame of the apparatus for detecting the vertical displacement of the indenter (column 3, lines 13-18) and communicating the displacement data to a computer that controls the motor based on the measured information in order to keep a predetermined load applied to the specimen (column 3, lines 48-52) and control the rate of movement of the indenter (column 3, lines 53-56), as well as the depth of penetration of the indenter into the specimen (column 4, lines 3-16). Merck, Jr. also teaches that the computer receives the force/pressure measurements from the load cell to processes, control, and display test results (column 3, lines 18-24). Further, it is considered inherent that the computer contains the associated software that would be needed to perform the aforementioned functions.

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus to include the specific construction of the motorized plunger, as taught by Merck, Jr. because, as suggested by Merck, Jr., the combination would have provided the automated motion, needed to carry out the invention of HortPlus, using a device and method that eliminates the need for a lot of movable parts to provide an accurate, easy to use penetrometer (column 1, line 62 to column 2, line

4, and column 2, lines 13-24). Further, it would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus to include an optoelectric sensor for sensing the position of the plunger, as taught by Merck, Jr., because, as suggested by Merck, Jr., the combination would have increased the accuracy of the measured data by using a position sensing device that is unaffected by mechanical friction error (column 3, lines 39-46). Also, it would have been obvious to one having ordinary skill in the art to control the motor speed in accordance with the motor speed of previous successful fruit testing runs because it would have insured consistently accurate test results each time the invention is used.

Buschmann teaches a universal mechanical testing device comprising a frame having a base supporting laterally opposed up standing sides interconnected by a top, and a platform above the base between the upstanding sides located beneath a vertically oriented cylindrical plunger (Figure 1a) that can be adjusted to insure that the axis of the plunger aligns with the center of a centering plate (column 5, line 63 to column 6, line 8). Buschmann also teaches an actuator for controlling the movement of the plunger into a specimen, and a load cell for sensing the applied force and producing a force measurement signal (column 2, lines 30-35) wherein the force measurements are accurate to 5 mg (approximately .000011023 lbs.) and displacement measurements are accurate to 25 nm (approximately 9.8425×10^{-7} inches).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus to include the physical design of the fruit tester, as taught by

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Buschmann, because, as suggested by Buschmann, the combination would have provided a particular design that insured high accuracy by allowing for fine vertical alignment between the penetrating plunger and the specimen (column 2, lines 53-61).

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over HortPlus in view of Merck, Jr. and Buschmann, and further in view of U.S. Patent No. 5,760,312 to MacKay et al.

As noted above, HortPlus in combination with Merck, Jr. and Buschmann teach many of features of the claimed invention including providing a defined chamber surrounding the specimen under test (Buschmann et al. column 6, lines 41-51) but do not teach a testing chamber defined above the base between the opposed sides with a rear shield and a movable front shield, and a cover to enclose the fruit tester above the testing chamber

MacKay teaches a penetration-type testing device wherein the object under test is placed in a cylindrical chamber having a front shield, back shield, and top cover (Figure 6). MacKay teaches that the object under test is placed within the central axis of the chamber, the shields are selectively moved to penetrate the object under test (column 1, lines 37-39), and the penetrating protrusions are pressed into the object with either a set force, and the displacement of the device is measured, or the protrusions are pressed into the device by a fixed displacement, and the force on the object is measured (column 1, lines 50-55). MacKay also teaches comparing the

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obtained measurements to reference data for determining the condition of the object (column 1, lines 43-45).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck, Jr., Buschmann to include a testing chamber defined above the base between the opposed sides with a rear shield and a movable front shield, and a cover to enclose the fruit tester above the testing chamber, as taught by MacKay, because the combination would have provided a method for restricting the movement of the fruit during testing. Further, since the applicant describes the purpose of the chamber as a means for keeping debris from entering the testing area (page 19, lines 3-16), which is taught by both the inventions of Buschmann and MacKay, and the claimed invention could be successfully implemented without the required specifics of the chamber, the remaining specifics of the testing chamber are considered to be an engineering design choice.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over HortPlus in view of Merck, Jr. and Buschmann, and further in view of U.S. Patent No. 4,937,924 to Leuchtenmuller.

As noted above, HortPlus in combination with Merck, Jr. and Buschmann teach all the features of the claimed invention except for including a stripper plate, carried between the sides spacedly above the centering plate, wherein the stripper plate defines an orifice for passage of the plunger but prevents passage of the fruit.

Leuchtenmuller teaches a needling apparatus that comprises a motor driving the vertical motion of a needle through a piece of felt and a stripper plate disposed between the needle and a support platform which has an orifice for passage of the needle but not the felt (column 2, lines 59-66).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck, Jr., and Buschmann to include a stripper plate, carried between the sides spacedly above the centering plate, wherein the stripper plate defines an orifice for passage of the plunger but prevents passage of the fruit, as taught by Leuchtenmuller, because, as suggested by Leuchtenmuller, the combination would have provided a method for performing repeated penetration of an object that, by holding the object being penetrated in place, would eliminate the need for stopping the process after each penetration to remove the penetrator (column 3, lines 6-8).

15. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over HortPlus in view of Merck, Jr. and Buschmann, and further in view of U.S. Patent No. 5,691,473 to Peleg and U.S. Patent No. 5,850,044 to Spletzer.

As noted above, HortPlus in combination with Merck, Jr. and Buschmann teach many of the features of the claimed invention including implementing a load cell to sense and transmit pressure data, but do not teach a battery powering means, or a plurality of strain gauges interconnected in a bridge circuit to sense and transmit pressure data.

Peleg teaches a method and equipment for measuring firmness of fruits and vegetables comprising two gripper bodies that hold a fruit at a predetermined pressure of force while a vibration actuator excites the fruit (column 2, lines 55-63), for measurement by a transducer (column 2, lines 64-67), to determine a firmness index (column 3, lines 7-11). Peleg also teaches that the device be light weight and contain a rechargeable battery power source (column 9, lines 9-14).

Spletzer teaches a load cell comprising a plurality of strain gauges that measure the axial surface strain along a given axis (column 1, lines 51-52) wherein the strain gauges are interconnected in a Wheatstone bridge circuit (column 8, lines 10-15).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck, Jr., and Buschmann to include a battery powering means, as taught by Peleg, because, as suggested by Peleg, the combination would have provided a device for measuring fruit firmness that is portable and can be used in the field or orchard (column 4, lines 46-59)

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck, Jr., and Buschmann to include a plurality of strain gauges interconnected in a bridge circuit to sense and transmit pressure data, as taught by Spletzer, because Spletzer presents an accurate load cell that would be applicable as the pressure sensing load cells of the inventions of HortPlus, Merck, Jr., and Buschmann.

16. Claims 2 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable

over HortPlus in view of Merck, Jr. and Buschmann, and further in view of EP 0 439 405 A1 to Abbal et al.

As noted above, HortPlus in combination with Merck, Jr. and Buschmann teach many of the features of the claimed invention, including a plunger aligned with the center of a centering plate (Buschmann et al., column 5, line 63 to column 6, line 8), applying the plunger at a constant velocity and holding the plunger at a particular data point for a predetermined amount of time for measuring the constant pressure (Buschmann et al., column 3, lines 44-51), as well as applying a predetermined time allotted for measuring the position and pressure (Buschmann et al., column 7, lines 14-19 and 41-46), but do not specify that the centering plate comprise a conic indentation or that the penetration depth and pressure measurements are taken at a plurality of data points.

Abbal teaches a penetration type fruit tester wherein a fruit is placed on a dished (i.e. conic shaped) support resting on a support platform of a stand, a motor controls the penetration of the fruit by a chuck, and a recording means records a plurality of force and penetration distance values that provide a characteristic profile for the fruit (Abstract).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck Jr. and Buschmann to include specifying that the centering plate comprise a conic indentation, as taught by Abbal, because the combination would have provided a means for holding the fruit in place under the plunger without the use of physical restraints. Further, it would have been obvious

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to one having ordinary skill in the art to modify the invention of HortPlus, Merck Jr. and Buschmann to include taking pressure measurements at a plurality of data points, as taught by Abbal, because the combination would have provided a thorough analysis of the fruit by taking into account variations in the fruit texture when constructing a characteristic profile.

17. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over HortPlus in view of Merck, Jr., Buschmann, and Abbal, and further in view of U.S. Patent No. 6,240,766 to Cawley.

As noted above, HortPlus in combination with Merck, Jr., Buschmann, and Abbal teach all the features of the claimed invention, except for analyzing the numeric values of the frequency dependent pressure variations through finite Fourier transformation to derive a numeric measure representing fruit maturity and condition by comparing the pressure values with similar values derived from known fruit data.

Cawley teaches a method for assessing the ripeness or firmness of fruit comprising an impactor in the form of a plunger that moves, at an adjustable speed, towards the fruit under test, strikes the surface of the fruit, and provides a measure of the peak value and duration of the force to determine the firmness of the fruit (column 3, lines 9-22 and 23-32). Cawley also teaches analyzing the force data by constructing a force-frequency curve through Fourier analysis of the force-time data (column 4, lines 36-55) that indicates a numerical output directly indicative of the

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ripeness of the fruit (column 4, lines 63-65) by comparing the obtained data with known ripening data for the particular fruit (column 4, lines 65-67).

It would have been obvious to one having ordinary skill in the art to modify the invention of HortPlus, Merck, Jr., Buschmann, and Abbal to include analyzing the numeric values of the frequency dependent pressure variations through finite Fourier transformation to derive a numeric measure representing fruit maturity and condition by comparing the pressure values with similar values derived from known fruit data, as taught by Cawley, because, as suggested by Cawley, the combination would have provided a method for easily displaying the fruit firmness results in a graphical form without the need for defining what fruit firmness information the individual points on the graph display (column 4, lines 13-20).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 4,479,424 to Carroll teaches a juicer for separating pulp and juice from the fruit using a stripper plate.

U.S. Patent No. 5,918,266 to Robinson teaches a method and apparatus for non-destructive measurement of firmness index and calculation of firmness for a fruit in a testing chamber.

U.S. Patent No. 6,247,356 to Merck, Jr. et al. teaches a mechanical plunger-type hardness tester.

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19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw

May 14, 2002



MARC S. HOFF
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